



# ILMK 382

## Stainless Steel Probe

Ceramic Sensor

accuracy according to IEC 60770:  
standard: 0.35 % FSO  
option: 0.25 % FSO

### Nominal pressure

from 0 ... 40 cmH<sub>2</sub>O up to 0 ... 200 mH<sub>2</sub>O

### Output signals

2-wire: 4 ... 20 mA  
3-wire: 0 ... 10 V  
others on request

### Special characteristics

- ▶ diameter 39.5 mm
- ▶ especially for sewage, viscous and pasty media

### Optional versions

- ▶ IS-protection zone 0
- ▶ mounting with stainless steel pipe
- ▶ flange version
- ▶ diaphragm 99.9 % Al<sub>2</sub>O<sub>3</sub>
- ▶ different kinds of cables
- ▶ different kinds of elastomers

The stainless steel probe ILMK382 has been designed for continuous level measurement in waste water, waste and higher viscosity media.

Basic element is a robust and high overpressure capable capacitive ceramic sensor e.g. for low levels easily.

### Preferred areas of use are



#### Water

drinking water abstraction



#### Sewage

waste water treatment  
water recycling



#### Fuel / Oil

level monitoring in open tanks  
with low filling heights  
fuel storage  
tank farms / biogas plants



Input pressure range																
Nominal pressure gauge	[bar]	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	20
Level	[mH <sub>2</sub> O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	200
Overpressure	[bar]	2	2	4	4	6	6	8	8	15	25	25	35	35	45	45

Output signal / Supply	
Standard	2-wire: 4 ... 20 mA / V <sub>S</sub> = 9 ... 32 V <sub>DC</sub>
Option IS-protection	2-wire: 4 ... 20 mA / V <sub>S</sub> = 14 ... 28 V <sub>DC</sub>
Option 3-wire	3-wire: 0 ... 10 V / V <sub>S</sub> = 12.5 ... 32 V <sub>DC</sub>

Performance	
Accuracy <sup>1</sup>	standard: $\leq \pm 0.35$ % FSO option: $\leq \pm 0.25$ % FSO
Permissible load	$R_{\max} = [(V_S - V_{S \min}) / 0.02 \text{ A}] \Omega$
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / k $\Omega$
Long term stability	$\leq \pm 0.1$ % FSO / year at reference conditions
Turn-on time	700 msec
Mean response time	< 200 msec
Max. response time	380 msec
	measuring rate 5/sec

<sup>1</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

Thermal effects (Offset and Span)	
Thermal error	$\leq \pm 0.1$ % FSO / 10 K in compensated range 0 ... 70 °C

Permissible temperatures	
Permissible temperatures	medium: -25 ... 125 °C electronics / environment: -25 ... 125 °C storage: -25 ... 125 °C

Electrical protection <sup>2</sup>	
Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
Electromagnetic compatibility	emission and immunity according to EN 61326

<sup>2</sup> additional external overvoltage protection unit in terminal box KL 1 or KL 2 with atmospheric pressure reference available on request

Electrical connection (only for 4 ... 20 mA / 2-wire)	
Cable with sheath material <sup>3</sup>	PVC (-5 ... 70 °C) grey PUR (-25 ... 70 °C) black FEP (-25 ... 70 °C) black TPE (-25 ... 125 °C) blue

<sup>3</sup> shielded cable with integrated air tube for atmospheric pressure reference

Materials (media wetted)	
Housing	stainless steel 1.4404 (316 L)
Seals	FKM FFKM EPDM others on request
Diaphragm	standard: ceramics Al <sub>2</sub> O <sub>3</sub> 96 % Option: ceramics Al <sub>2</sub> O <sub>3</sub> 99.9 %
Nose cone	POM

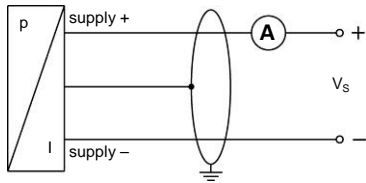
Explosion protection	
Approval DX14-LMK 382	zone 0 <sup>4</sup> : II 1G Ex ia IIB T4 Ga zone 20: II 1D Ex iaD 20 T 85°C
Safety technical maximum values	U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 660 mW, C <sub>i</sub> = 27 nF, L <sub>i</sub> = 5 $\mu$ H
Permissible media temperature	in zone 0: -10 ... 60 °C with p <sub>atm</sub> 0.8 bar up to 1.1 bar zone 1 and higher: -10 ... 70 °C
Connecting cables (by factory)	cable capacitance: signal line/shield also signal line/signal line: 160 pF/m cable inductance: signal line/shield also signal line/signal line: 1 $\mu$ H/m

<sup>4</sup> for optional stainless steel pipe following designation is valid: "II 1G Ex ia IIC T4 Ga" (zone 0)

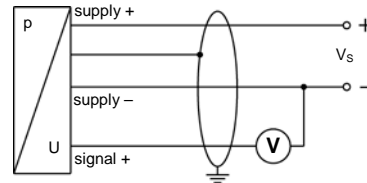
Miscellaneous	
Current consumption	max. 21 mA
Weight	approx. 400 g (without cable)
Ingress protection	IP 68
CE-conformity	EMC Directive: 2004/108/EC

### Wiring diagram

2-wire-system (current)



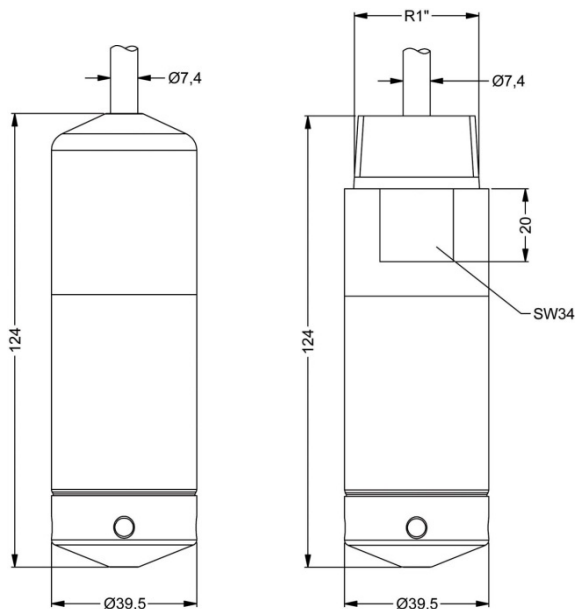
3-wire-system (voltage)



### Pin configuration

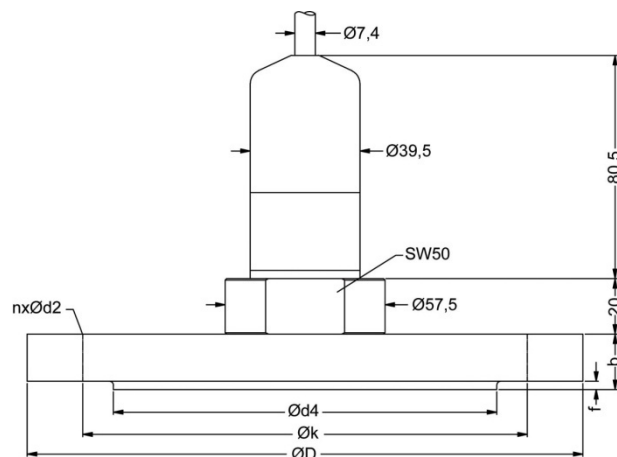
Electrical connection	cable colours (DIN 47100)
Supply +	wh (white)
Supply -	bn (brown)
Signal + (only for 3-wire)	gn (green)
Shield	gn/ye (green / yellow)

### Dimensions (in mm)



LMK 382 standard

LMK 382 with thread R1"  
for stainless steel pipe

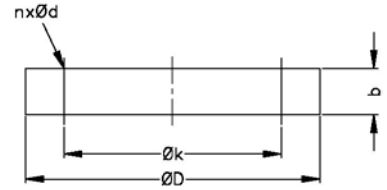


LMK 382  
flange version

dimen- sions	dimensions in mm			
	DN25 / PN40	DN40/ PN40	DN50 / PN40	DN80 / PN16
D	115	150	165	200
k	85	110	125	160
d4	68	88	102	138
b	18	18	20	20
f	2	3	3	3
n	4	4	4	8
d2	14	18	18	18

### Transmitter flange for flange version

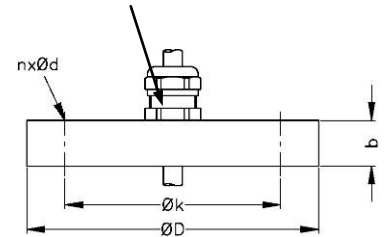
Technical data		
Suitable for	ILMK 382, ILMK 382H, ILMK 458, ILMK 458H	
Flange material	stainless steel 1.4404 (316L)	
Hole pattern	according to DIN 2507	
Version	Size (in mm)	Weight
DN25 / PN40	D = 115, k = 85, b = 18, n = 4, d = 14	1.2 kg
DN50 / PN40	D = 165, k = 125, b = 20, n = 4, d = 18	2.6 kg
DN80 / PN16	D = 200, k = 160, b = 20, n = 8, d = 18	4.1 kg
Ordering type		Ordering code
Transmitter flange DN25 / PN40		ZFS2540
Transmitter flange DN50 / PN40		ZFS5040
Transmitter flange DN80 / PN16		ZFS8016



### Mounting flange with cable gland

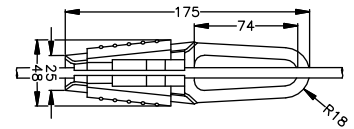
Technical data		
Suitable for	all probes	
Flange material	stainless steel 1.4404 (316L)	
Material of cable gland	standard: brass, nickel plated on request: stainless steel 1.4305 (303); plastic	
Seal insert	material: TPE (ingress protection IP 68)	
Hole pattern	according to DIN 2507	
Version	Size (in mm)	Weight
DN25 / PN40	D = 115, k = 85, b = 18, n = 4, d = 14	1.4 kg
DN50 / PN40	D = 165, k = 125, b = 20, n = 4, d = 18	3.2 kg
DN80 / PN16	D = 200, k = 160, b = 20, n = 8, d = 18	4.8 kg
Ordering type		Ordering code
DN25 / PN40 with cable gland brass, nickel plated		ZMF2540
DN50 / PN40 with cable gland brass, nickel plated		ZMF5040
DN80 / PN16 with cable gland brass, nickel plated		ZMF8016

cable gland M16x1.5 with seal insert (for cable-Ø 4 ... 11 mm)



### Terminal clamp

Technical Data		
Suitable for	all probes with cable Ø 5.5 ... 10.5 mm	
Material	standard: steel, zinc plated optionally: stainless steel 1.4301 (304)	
Weight	approx. 160 g	
Ordering type		Ordering code
Terminal clamp, steel, zinc plated		Z100528
Terminal clamp, stainless steel 1.4301 (304)		Z100527



### Ordering code IMK 382

IMK 382

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Pressure		5	6	5										
	in bar	5	6	5										
	in mH <sub>2</sub> O	5	6	6										
Input	[mH <sub>2</sub> O]	[bar]												
	0.40	0.04	0	4	0	0								
	0.60	0.06	0	6	0	0								
	1.0	0.10	1	0	0	0								
	1.6	0.16	1	6	0	0								
	2.5	0.25	2	5	0	0								
	4.0	0.40	4	0	0	0								
	6.0	0.60	6	0	0	0								
	10	1.0	1	0	0	1								
	16	1.6	1	6	0	1								
	25	2.5	2	5	0	1								
	40	4.0	4	0	0	1								
	60	6.0	6	0	0	1								
	100	10	1	0	0	2								
	160	16	1	6	0	2								
	200	20	2	0	0	2								
	customer		9	9	9	9								
Housing												consult		
	Stainless steel 1.4404 (316L)	1												
	customer	9										consult		
Diaphragm												consult		
	Ceramics Al <sub>2</sub> O <sub>3</sub> 96%	2												
	Ceramics Al <sub>2</sub> O <sub>3</sub> 99.9%	C												
	customer	9										consult		
Output												consult		
	4 ... 20 mA / 2-wire	1												
	0 ... 10 V / 3-wire	3												
	Intrinsic safety 4 ... 20 mA / 2-wire	E												
	customer	9										consult		
Seals												consult		
	FKM	1												
	EPDM	3												
	FFKM	7												
	customer	9										consult		
Electrical connection												consult		
	PVC-cable <sup>1</sup>	1												
	PUR-cable <sup>1</sup>	2												
	FEP-cable <sup>1</sup>	3												
	TPE-cable	4												
	customer	9										consult		
Accuracy												consult		
	standard	0.35 %	3											
	option	0.25 %	2											
	customer		9										consult	
Cable length												consult		
	in m													
	standard: 3 m	PVC	0 0 3											
	standard: 5 m	PVC	0 0 5											
	standard: 10 m	PVC	0 1 0											
	standard: 15 m	PVC	0 1 5											
	standard: 20 m	PVC	0 2 0											
	<b>special length</b>	<b>PVC</b>	<b>9 9 9</b>											
	standard: 3 m	PUR	0 0 3											
	standard: 5 m	PUR	0 0 5											
	standard: 10 m	PUR	0 1 0											
	standard: 15 m	PUR	0 1 5											
	standard: 20 m	PUR	0 2 0											
	<b>special length</b>	<b>PUR</b>	<b>9 9 9</b>											
	standard: 5 m	FEP	0 0 5											
	standard: 10 m	FEP	0 1 0											
	<b>special length</b>	<b>FEP</b>	<b>9 9 9</b>											
	<b>special length</b>	<b>TPE</b>	<b>9 9 9</b>											
Special version												consult		
	standard	0 0 0												
	prepared for mounting <sup>2</sup>	5 0 2												
	with stainless steel pipe	5 1 0												
	flange version	5 1 0												
	customer	9 9 9										consult		

<sup>1</sup> cable with integrated air tube for atmospheric pressure reference

<sup>2</sup> stainless steel pipe is not part of the supply

Standard lengths 3 / 5 / 10 / 15 / 20 m are available from stock, special lengths are manufactured order-related, price per meter (see above).